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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)
)
Amendment of the Commission's)
Rules to Establish New)
Personal Communications Services)

GEN Docket No. 90-314

To: The Commission

OPPOSITION TO PETITION FOR RECONSIDERATION

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Omnipoint Communications, Inc. ("Omnipoint"), by its attorneys and pursuant to Section 1.429(f) of the Commission's rules, opposes the March 30, 1994 Petition for Reconsideration (the "Petition") of Qualcomm, Incorporated ("Qualcomm") in the above-referenced proceeding.

INTRODUCTION AND SUMMARY

Qualcomm claims the Commission's Third Report and Order¹ (1) failed to adequately consider the evidence that Qualcomm deserved a pioneer's preference, (2) erred in granting Omnipoint a preference, and (3) was generally "replete with errors." Omnipoint disagrees.

The Commission's decision embodied in the Third Report and Order was the product of a careful application of the previously-enunciated pioneer's preference standards to a fully developed record. In the orders establishing the preference rules in GEN Docket No. 90-217, the Commission carefully considered and reconsidered the appropriate preference criteria. In this proceeding, the Commission faithfully applied the preference criteria to the record evidence.

¹ In the Matter of Amendment of the Commission's Rules to Establish New Personal Communications Services, Third Report and Order, GEN Docket No. 90-314, 59 Fed. Reg. 9419 (February 28, 1994) (the "Third Report and Order").

This was not arbitrary decision making. The full record included the original preference requests, comments and reply comments on those requests, a tentative preference decision in light of the comments, then comments and reply comments on the tentative decision, and, after one and one-half years, a final decision. Supplementing the record all along were technical reports based on preference requesters' experimental license operations. The complete record reflects not only Qualcomm's failure to demonstrate its eligibility for a preference, it shows that Omnipoint is a recognized and unique pioneer in PCS. The Commission's Third Report and Order logically reflects the overwhelming evidence supporting these final preference decisions.

DISCUSSION

I. THE GRANT OF A PREFERENCE TO OMNIPOINT WAS FULLY JUSTIFIED BY THE RECORD.

Qualcomm's attack on Omnipoint consists primarily of the following tactics: 1) Qualcomm invents criteria that it believes favor its new claim for a pioneer's preference proposal and then it tries to show that Omnipoint's proposal does not meet the new Qualcomm-defined criteria for a preference; 2) Qualcomm fabricates assertions about Omnipoint's system; 3) Qualcomm asserts, without any evidence, that other companies' statements are false with respect to tests of Omnipoint's system or delivery dates of equipment; 4) Qualcomm ignores the record whenever it refutes any of Qualcomm's allegations; 5) Qualcomm challenges both the integrity and the competence of the Commission with respect to the broadband pioneer's preference decision.

All of these attacks are utterly without merit, as will be shown below. For ease of reference, our structure in this section follows the order of Qualcomm's arguments. See Petition at 9-19.

A. Technological Development

First, Qualcomm takes the stance that Omnipoint's system does not meet the criteria for technological development because, among other factors, it involved radio frequency engineering. Qualcomm states that radio frequency engineering "has almost nothing to do with the baseband signal processing that is the heart of any digital PCS system." Petition at 9. Qualcomm now introduces this argument because it had failed to satisfy its earlier preference application claims with respect to rf engineering (for example, its original OFS rf sharing claims) and so it wants to switch its preference claims to digital ASIC development. This is just one example of Qualcomm trying to invent new Qualcomm-specific criteria for evaluating preferences retroactively.

In fact, Qualcomm's assertions demonstrate how little it understands the pioneer's preference policy. Qualcomm's statement that "[t]he rf portion of communications equipment is associated with the particular transmission frequency allocated to provide a given service," id., specifically uncovers its ignorance of the pioneer's preference rules. Indeed, the rules were explicitly designed to reject claims like Qualcomm's. In 1991, the Commission stated that it would "not award a preference for a new digital or narrowband technology that promises more efficient use of the spectrum if it is not linked to a specific service." Report and Order, 6 FCC Rcd. 3488, n.7 (1991). As Qualcomm acknowledges, Omnipoint's equipment is linked to a specific service.

Next, Qualcomm fabricates statements about Omnipoint's system and manages to get the meaning of a technical parameter completely backwards. Qualcomm appears not to understand the difference between interference rejection to one's own system and minimizing interference to other systems. It predicates its false statement that Omnipoint changed nothing in the spread spectrum technology of its ISM equipment for its 2 GHz PCS system on the fact that the ISM equipment used anti-jamming technology. Petition at 10. By definition, "jamming margin" refers to the interference resistance of the Omnipoint ISM system from external interferers. This

has almost nothing to do with how much interference an Omnipoint ISM system might cause to other specific users of the same frequencies.

In contrast to Qualcomm, Omnipoint went to great lengths to study the specific characteristics of actual 2 GHz OFS microwave receivers and their interference susceptibility to different types of PCS signals. These studies were exhaustively documented in our pioneer's preference submissions² and experimental reports, as well as in the experimental reports of others.³ Omnipoint's system for 2 Ghz PCS is significantly different from its earlier 902-928MHz developments as a consequence, and this was detailed in those reports and Omnipoint's Experimental Report of April, 1992.

Finally, ignoring that numerous experimental reports refer to the frequency agility of the Omnipoint handsets,⁴ Qualcomm simultaneously questions the Commissions conclusion that the handsets switch frequencies and, if true, trivializes this accomplishment. The Omnipoint system's ability to operate in either the proposed licensed bands or the unlicensed bands was unique at the time of the pioneer's preference applications, and appears to still be the only implementation of this idea nearly two years later. There is no evidence or even claim on the part of Qualcomm that its system can do this. Indeed, we are not aware of any Qualcomm experimental report describing tests of Qualcomm's handsets' ability to switch frequencies while maintaining communications. In fact, in the only description of Qualcomm's alleged frequency agility, the entire system appears to have been shut off and the frequencies were changed manually. APC Tenth Progress Report at 3 (January 26, 1993). Thus, Qualcomm should not so

² Pioneer's Preference Request of Omnipoint, at Attachment B (May 4, 1992); Omnipoint Reply Comments, GEN Docket No. 90-314, at Attachment (filed June 25, 1992); Omnipoint Reply Comments, GEN Docket No. 90-314, at Attachment (filed March 1, 1993).

³ Experimental Report of Southwestern Bell (December 7, 1992).

⁴ Cox Enterprises Seventh Experimental Report (November 19, 1993); Cox Enterprises Tenth Experimental Report (August 20, 1993); Omnipoint Reply Comments, GEN Docket No. 90-314, Attachments B and C (March 1, 1993); Omnipoint Experimental License Report (August, 1993).

glibly trivialize these accomplishments, especially since the rest of the industry is now scrambling for means to achieve this same benefit to the consumer which Omnipoint pioneered.

B. Technical Feasibility

(a) Reports

Qualcomm's tactics in this regard are a bizzare amalgamation of distorting the statements of others, accusing them of making false statements, ignoring the record, and ignoring the fact that others have already refuted many of Qualcomm's false claims when they were made in earlier submissions. Indeed, Qualcomm's underlying premise in this section, that Omnipoint has not demonstrated a "functional" system, was already rejected by the Commission in two prior decisions. Tentative Decision, 7 FCC Rcd. 7794 (1992); Third Report and Order.

Qualcomm originally made the assertion that there was no evidence that Omnipoint had built a "working" system, unaware of how many companies were using Omnipoint's 2 GHz equipment. Qualcomm Comments, GEN Docket No. 90-314, at 24 (January 29, 1993). The accusation demonstrated that, in 1993, Qualcomm was far removed from the activities of the 2 GHz PCS industry and ignorant of customer press reports and of experimental reports filed with the Commission discussing the tests of our 2 GHz PCS system. In the reply period, Omnipoint cited some of these customers' experimental reports as well as our own experimental reports to rebutt Qualcomm's ridiculous accusation. Omnipoint Reply Comments, GEN Docket No. 90-314, at 24-25 (March 1, 1993).

Just prior to the Commission's September 23, 1993 meeting to adopt the Second Report and Order, 8 FCC Rcd. 7700 (1993), Qualcomm filed an illegal and late "supplemental comment". Supplemental Comments of Qualcomm, GEN Docket No. 90-314 (July 27, 1993). The essence of its attack on Omnipoint was that, while Omnipoint may have built a 2 GHz PCS system after all, it was not as good as Qualcomm's proposal. Qualcomm shifted its accusation to claiming the Omnipoint PCS system was not yet commercial and that it was not "viable". Id. at 31.

In the Petition, Qualcomm has now changed the character of its misrepresentation of these same experimental reports. Qualcomm neglects to mention that its prior accusations have already been refuted. For example, Cox refuted Qualcomm's prior misrepresentations. See Omnipoint Opposition to Motion for Leave to File Supplemental Comments, Attachment of Alpha Resources, (August 11, 1993). Now, in effect, Qualcomm admits that Omnipoint may have built a 2 GHz PCS system, and it may be operational. But, Qualcomm then creates a series of criteria to evaluate Omnipoint's pioneer's preference to which Qualcomm holds no other company, including its own. Additionally, it challenges the veracity of the APT and Ameritech reports with respect to whether they actually tested Omnipoint's equipment at the times they stated in those reports.

(i) American Portable Telecommunications ("APT")

Even though APT, in its July 15, 1992 experimental report, states that it tested Omnipoint's 1.85-1.99 GHz equipment, Qualcomm challenges that claim by latching on to APT's statement that "Omnipoint and other vendors have advised APT that the 1.85-1.99 GHz equipment will be available late in the third quarter or early in the fourth quarter of 1992." Petition at 12. These APT statements were true and are far from contradictory. The difference between performing joint tests with a customer and delivering to them quantities of equipment are obvious. Qualcomm, of all companies, should be keenly aware of this typical procedure among vendors, having stated at many conferences that this was its practice from 1989 until at least 1992. The fact that Omnipoint took its 1.9 GHz equipment to the customer sites for testing in early 1992, but did not offer it for general sale until later reflects the common practice of early alpha prototype testing with selected customers.

APT also decided to purchase Omnipoint's 900MHz equipment, which was for sale, in the interim, while initial prototype testing of the 1.9GHz system continued. Contrary to Qualcomm's assertions, APT's June 15, 1992 report described both the 900MHz cordless phone as well as the 1.9GHz pocket phone Omnipoint equipment, including photos. See APT Report,

Exhibit 1 (June 15, 1992). Indeed, this also adds to the refutation of Qualcomm's false assertion that the 1.9GHz equipment was nothing other than an upbanded 900MHz cordless phone. Had the 1.9GHz system been just an upbanded version of the 900MHz equipment, there would have been no reason to delay its sale.

(ii) **Ameritech**

Qualcomm attempts the same distortion in describing Ameritech's statements. Ameritech tested the Omnipoint 1.9GHz system at multiple stages of its development, at its own facilities and at Omnipoint's labs in Colorado Springs, beginning in late 1991 and ongoing today. On June 25, 1992, it stated that, "Ameritech, which commissioned the product for its trial, can commend [Omnipoint's PCS equipment] as the first operational CDMA handset at 1850 MHz." Reply Comments of Ameritech, GEN Docket No. 90-314, at n.3 (June 25, 1992). Again, because this was performed jointly without shipping final versions for general sale, Qualcomm accuses Ameritech of lying.

Qualcomm also fabricates adjectives to mischaracterize Ameritech's statements. It transforms Ameritech's statement that "[w]hile the basic functionality of the equipment was proved, product refinement discussions were continued," into an alleged acknowledgment by Ameritech of "the deficiency of the equipment". Petition at 12.

Qualcomm simply ignores the record when it claims "there is no evidence that Ameritech ever used Omnipoint equipment in its extensive PCS trial." Petition at 13. To the contrary, Ameritech's experimental reports and press releases clearly stated that it was conducting two trials with two vendors: Motorola CT2 equipment for *market* tests, and Omnipoint spread spectrum equipment for *technical* trials. See Ameritech Experimental Progress Reports filed November 22, 1991, February 28, 1992, and May 29, 1992 at 6. Implying that Omnipoint should have been part of Ameritech's market trial is another example of Qualcomm inventing artificial criteria for Omnipoint to meet. Ameritech never stated that it would use Omnipoint's equipment for a market trial.

In contrast, APC stated 15 months ago that Qualcomm would be supplying it with 50 portables in the second quarter of 1993 and said this would allow it to "mirror a commercial PCS system" and "provide the service for which APC's CT-2 test market participants have been asking." APC Tenth Progress Report, at 17 (January 26, 1993). Omnipoint has neither seen nor heard of such market test nor any tests with 50 portables. There is no evidence any company ever conducted any market trials of Qualcomm's system at 1.9 GHz.

But the most egregious distortion is that Qualcomm makes these attacks without ever noting that Ameritech replied to an earlier attack by Qualcomm in March 1, 1993.

Ameritech concurs with the Commission's decision that Omnipoint should be awarded a preference based on its development of 2 GHz equipment that utilizes advanced techniques that will facilitate the continued development and implementation of PCS services and technologies. *This equipment and the advanced spread spectrum technology upon which it is based are truly innovative and hold incredible promise for the future of PCS.* Such innovation is an example of the benefits the Commission is hoping to achieve with the grant of pioneer preferences and should be encouraged.

Reply Comments of Ameritech, GEN Docket No. 90-314, at 4 (March 1, 1993). (emphasis added).

(iii) Cox

Qualcomm's tactic in this case is to lift statements out of context, distort their meaning, and ignore Cox's statements that refute Qualcomm's false assertions.

First, out of hundreds of pages of experimental reports by Cox, which are favorable reviews of their tests of Omnipoint's equipment, Qualcomm tries to resurrect an old issue that has since been solved. The issue is its claim that an over-the-air TDD system cannot be used with Cox's vision of a purely centralized modulation architecture. Cox has twice refuted this assertion.

In the very experimental report from which Qualcomm quotes as supporting the existence of a TDD problem, Cox explains that CableLabs successfully funded a solution for the whole

cable industry to the over-the-air TDD issue. In explaining the test of this solution with a TDD CT-2 system, Cox wrote:

With as much as 31.5 miles of fiber introduced into the system, the associated time delay did not cause a problem. These tests on July 9 and July 12, 1993 with TDD format and the Cox tests conducted in March 1992 with FDD format clearly illustrate that with proper system design, the advantages of centralized modulation, which only broadband cable offers, can be *utilized independent of the off-air rf format*.

Experimental License Report of Cox Enterprises, at 4, (August 20, 1993) (emphasis added).

Further, Cox's consultant who performed all of the PCS tests, wrote in support of Omnipoint's opposition to Qualcomm's July 27, 1993 illegal "supplemental comments" that "Cox's most recent field tests of Omnipoint equipment and discussions with Omnipoint engineers indicate that the added delay can be accommodated by modification of the Omnipoint system." See August 9, 1993 Letter from Alpha Resources, Inc., attached to Omnipoint's Opposition to Motion for Leave to File Supplemental Comments GEN Docket No. 90-314 (August 11, 1993).

Finally, Qualcomm's quote from Cox's November 22, 1993 report saying it "will postpone additional testing of this system configuration" refers *not* to Omnipoint's equipment but to testing of Omnipoint's system in conjunction with another vendors' RAD/ RASP equipment. Qualcomm deliberately distorts the truth by ignoring the prior experimental report of Cox that described the highly successful tests of Omnipoint's system when used with multiple Coaxial Antenna Transcievers (CATs) instead of RAD/RASPs. In its August 20, 1993 report, Cox stated that the very first test of the CAT approach demonstrated that "[a] single base station and the 4 CATs effectively provided reliable coverage to 153 homes." Experimental License Report of Cox Enterprises at 5 (November 22, 1993). Additionally, Cox noted that in a neighborhood where forty mph is the maximum safe speed, "[a] 40 mile per hour vehicular handoff was successfully completed. Id.⁵

⁵ Cox also noted "Forty mph is the maximum safe speed in this neighborhood, not the maximum speed at which the system can accommodate handoffs. Id. at 17.

(iv) Southwestern Bell

Qualcomm devotes all of five sentences to criticizing Southwestern Bell's experimental report, which contains 156 pages of highly technical analysis regarding its spectrum sharing system and the nature of its experiments with Omnipoint's system. Qualcomm's criticism seems to be that the tests reported on in this experimental report only measured interference data over a few hours. Qualcomm ignores the weeks of preparation which SBPC went through to set up these tests and further ignores the fact that a few hours was more than enough time to collect the enormous amounts of data with respect to the purpose of the test. SBPC was also testing with actual OFS links in operation and wanted to borrow the minimal amount of time from these OFS users for setting up the interference measurement equipment and tests. With respect to calculating the Omnipoint system's relative improvement in reducing interference, the SBPC test duration was more than enough.⁶

(v) Time Warner

Qualcomm's summary of Time Warner's experimental reports on tests of Omnipoint's system is irrelevant. It appears that the paragraph's only purpose is to add filler before Qualcomm asserts incorrectly that Time Warner's tests "showed" that Omnipoint "had upbanded its cordless telephone to 1800 MHz." Petition at 14. Obviously the tests showed no such thing, nor could they have. In fact, the very line that Qualcomm quotes from in Time Warner's report refutes this. Id.

(b) Frequency Sharing

Qualcomm's entire argument demonstrates it's lack of understanding of QFS interference issues : 1) it doesn't understand Southwestern Bell Personal Communication's experiment even though it has had over one year to read the experimental reports; 2) it continues to be oblivious to how actual OFS receivers respond to different types of interference, and 3) it introduces

⁶ Consider that in the MCI report on Qualcomm's system, the tests ran for less than an average of 20 minutes each. First Progress Report of MCI, Tables 7.1, 7.2 and 7.3 (July 22, 1993).

anecdotal, non-sequiturs, regarding interference to and from devices having nothing to do with OFS receivers.

Qualcomm has never grasped that the SBPC test of Omnipoint's spectrum sharing capabilities was a *relative* test, i.e., relative to predictions of what interference Omnipoint's system would cause to an actual OFS receiver based on measured propagation data and interference analysis based on narrowband PCS sources of interference. From the perspective of minimizing interference to an OFS receiver, Omnipoint's system was proven by SBPC to outperform predictions for interference from a narrowband PCS system by 15dB, almost exactly what Omnipoint predicted in its pioneer's preference application. The Omnipoint system also caused zero interference on an absolute basis from only one mile away. But that was not the relevance of SBPC's tests with respect to Omnipoint's system. What Omnipoint cited in its March, 1993 Replies was the relative interference reduction of the Omnipoint system compared to a narrowband PCS type signal was as predicted. This relative improvement is true regardless of whether there was unidentified shadowing or not, since all attenuation is automatically factored into the interference predictions through the actual measurement techniques which SBPC used in the experiments.

Qualcomm alleges that the tests reported on in Omnipoint's study entitled "FDM-FM Microwave Link Propagation" do not reflect the interference characteristics of the Omnipoint PCS equipment because the source of interference was from "a Bob Dixon Box" instead of from an actual complete PCS system. Petition at 15. The Bob Dixon Box was used merely for convenience for performing the tests rather than switching out multiple actual PCS systems from multiple vendors of systems such as CT-2, GSM, etc. As noted in the study, the Bob Dixon Box was built to simulate multiple types of PCS transmit signals, from 100KHz to 40MHz. Some of those signals were replications of the relevant Omnipoint transmitter system parameters at bandwidths between 5MHz and 10MHz. Both prior to these tests and subsequent to them Omnipoint's actual PCS systems were also tested on the same actual OFS receivers with virtually

identical results as shown with the Bob Dixon Box. This also explains why both SBPC's tests of Omnipoint's system as well as APC's tests of Qualcomm's system bore out Omnipoint's predictions almost exactly despite both of these tests being performed completely independently of Omnipoint. See Omnipoint Reply Comments, Gen. Docket No. 90-314, Attachment (March 1, 1993).

Qualcomm's comment that APT reported interference to a wireless 902-928 MHz LAN operating few feet away from an Omnipoint 902-928MHz phone is irrelevant to the PCS-OFS interference analysis. Interference analysis is a function of many measured ratios and parameters indicating distance and power. Omnipoint's ongoing analysis of PCS interference to OFS receivers has been an ongoing carefully calibrated study involving many phases: 1) a theoretical analysis, 2) computer simulations by two outside, independent, firms; 3) carefully documented bench tests; 4) carefully conducted field tests on actual OFS links, and 5) independent customer tests. Omnipoint's analysis demonstrated the relative difference among different PCS systems for causing interference to actual OFS receivers. All of the predicted and measured distances were defined in terms of *miles and degrees outside the OFS beampath*. Further, nearly 90% of OFS receivers are analog consisting of hundreds of narrowband signals demodulated at baseband for which a wideband PCS system is more benign than a narrowband PCS source of interference.

In contrast, the wireless 900MHz LAN that Qualcomm implies is relevant to the 2GHz OFS analysis a) was *within feet not miles* of the Omnipoint system, b) the Omnipoint 900 MHz system signal is not the same as Omnipoint's 2 GHz PCS system, c) the distance to the other communicating part of the LAN was unknown, d) the power at which the LAN was transmitting is unknown, and e) the bandwidth, data rates, etc of the LAN are unknown. For Qualcomm to conclude that this reported interference between two ISM band devices operating in close proximity proves anything with respect to OFS sharing is disingenuous. Qualcomm's statement that the interference the LAN received "is an expected result of the pulsed or gated nature of the

Omnipoint waveform" is utter nonsense given that it knows absolutely nothing about the relative power levels, distances, etc., of the two systems.

Qualcomm's total disregard for a scientific analysis of PCS interference and sharing with OFS reaches a new low when it cites an anecdotal newspaper report that hearing aids in New Zealand experienced a buzzing sound from GSM phones as evidence that Omnipoint's system will be a serious source of interference to OFS microwave receivers. Qualcomm believes that this should be a convincing argument to rebut hundreds of pages of reports describing carefully designed 2 GHz PCS-OFS experiments proving the opposite.

(c) PSTN Compatibility

Qualcomm once again tries to create a criterion as a diversion from the real issues. Omnipoint stated that its system was being designed to be independent of network topology. Omnipoint explained in great detail why this was different from other systems, especially a pure CDMA system such as Qualcomm's proposal. Omnipoint Reply Comments, GEN Docket No. 90-314, at 19-24 (June 25, 1992). Instead, Qualcomm changes the issue to what it calls PSTN compatibility. It then states: "[t]here is no indication in the record that Omnipoint supplied or developed anything other than a standard RJ-11 telephone connection between its base station equipment and the PSTN or other non-Omnipoint interface equipment." Petition at 17.

This statement is false, but it is also irrelevant to the original issue. It is false because it has been extensively reported that Omnipoint created four different interfaces to the Cable TV network, and because Ameritech and Omnipoint have both reported on the unique Intelligent Base Station approach to interconnection to a Class 5 AIN network through ISDN signalling. Ameritech in its March 30, 1994 Reconsideration Petition refutes this recent Qualcomm assertion when it stated: that "[b]ased on its ongoing interaction with Omnipoint's design and development staff in the course of its PCS trial, Ameritech confirms that Omnipoint's system design does include such [an advanced AIN/ISDN] PSTN interface." Ameritech Petition for Reconsideration, GEN Docket No. 90-314, at 5 (March 30, 1994).

(d) Multiple Access/Frequency Reuse

Once again, Qualcomm simply ignores the record and then tries to invent new criteria. Only this time it invents criteria that Qualcomm's preference cannot meet, but which Omnipoint's does.

Qualcomm falsely states, "[n]one of the experimental reports filed by Omnipoint (or by other parties using Omnipoint equipment) discussed anything more than, at most, a few users operating in simple TDMA mode-no CDMA, no FDMA and no combined method." Petition at 18. The facts are that every test involving more than one Omnipoint 2GHz base station demonstrated the TDMA/CDMA/FDMA capabilities because that is how the system is always configured. Omnipoint has explained in great detail the architecture of its multiple cell and multiplexing techniques and will not repeat them here. With respect to frequency reuse, Omnipoint's extensive New York and Colorado Springs tests involved 12 base stations and 4 base stations, respectively, operating in an N=3 frequency pattern, with transmissions on every time slot. Additionally, Ameritech, Cox, and LCC have reported on testing Omnipoint's unique multiple access architecture. For example, LCC stated in its discussion: "LCC has reviewed the design and performance of Omnipoint's system for use in the 1.85-1.99 GHz band.... LCC has also viewed the system in operation.... Omnipoint is using a unique mix of CDMA, TDMA, and FDMA and deriving the best of all three." LCC attests to the fact that it confirmed "[m]ultiple handsets operating simultaneously, handoff between base stations, and frequency agility of the system." Attachment to Omnipoint replies March 1, 1993.

This false accusation against Omnipoint is part of Qualcomm's ongoing marketing attack, aimed not at the FCC, but at potential customers of Omnipoint's and Qualcomm's systems. Qualcomm keeps trying to redefine terms like multiplying, multiple access, frequency reuse, and CDMA to be synonymous with its techniques. Qualcomm's claim that Omnipoint has not proven its techniques both belies its ignorance of a system which uses TDMA within a cell and FDMA and CDMA among cells, as well as its ignorance of how a mobile centric system works.

Qualcomm makes its accusation to try to invent yet another criteria for evaluating only Omnipoint's pioneer's preference. Ironically, it is Qualcomm's preference request, rather than Omnipoint's, that cannot meet this new criteria. With Omnipoint's system, the primary methods of time and frequency orthogonality of the users makes the multiplexing techniques obvious and straight forward to test, and numerous tests have shown this with multiple handsets. In contrast, with Qualcomm's N=1 pure CDMA system all users are "on" all of the time on the same frequency, and every cell, and every cell sector are also supposed to be on at the same time on the same frequency. Thus, for example, even a simple range test for a single user on the Qualcomm system is completely a function of the total number of users and interference measured in that specific test and test configuration. Even more important, Qualcomm's capacity claims, indeed the proof of the "viability" of the Qualcomm system, is a function of how many users and how many cells are tested simultaneously in any specific test.

Yet, consider that Qualcomm dates the first successful "proof" of the capabilities of its system to their November, 1989 demonstration in San Diego of *one mobile unit and two cell sites*. Consider that MCI's test of Qualcomm's 1.9 GHz system reported in their July 22, 1993 experimental report primarily reported on testing with only *one* mobile unit and *two* cell sites and only testing range and Frame Error Rate, not capacity. First Progress Report of MCI (July 22, 1993). Even the most comprehensive report of Qualcomm's system at 1.9 GHz, that of APC filed on January 26, 1993, never tested more than 11 "mobiles" simultaneously, all loaded on to only *two* vans, during the critical reverse link capacity analysis portion of their tests. *Id.* at 13. It is not even clear if this test was all on one cell or what the other *two* cells were doing. The report had to keep qualifying the capacity estimates by saying it had adjusted the measured data to reflect future, untested, optimizations. Eleven users operating at an average of 3.5 kbps per user, or an aggregate of less than 40 kbps within 2.5 MHz in a single cell hardly proves Qualcomm's capacity claims. Further, consider that Cox's most recent test of Qualcomm's system measured range using only *one* mobile and *one* cell site (Twelfth Progress Report of Cox Enterprises)

(February 22, 1994)) even though other reports such as APC state that Qualcomm's cell sizes shrink as the number of cells on surrounding each cell increases, and their cells shrink further as the number of mobiles which are active simultaneously increases. (known as "breathing"). See APC Nineteenth Progress Report at 4 (January 26, 1993).

So how does Qualcomm make its capacity and range claims for its PCS system given how few mobiles and cells have ever been reported to have been tested simultaneously? Some of the experimental reports quietly mention something called the Other Users Noise Simulator or OUNS, and occasionally they mention something called the Orthogonal Channel Noise Simulator or OCNS. These are the magic black boxes that Qualcomm claims simulate the real world effect of other users that allows the capacity and range claims to be estimated. Yet note that Qualcomm never defines *exactly* what these black boxes do and none of their customers experimental reports describe them at all. The only report Omnipoint can find that states anything about these black boxes indicates that they generate Gaussian noise from a single location! Qualcomm November 1992 Experimental Report, Appendix A, Section 5. Any engineer knows that, taken literally, this by itself would not simulate the real world affect of additional users on an N=1 system.

Thus, perhaps the single most important parameter to testing the Qualcomm system's capacity and range claims, *i.e.*, loading up many cells with the maximum number of simultaneous users in each cell and each cell sector, is completely missing. (Recall also that nearly two thirds of Qualcomm's capacity claims come from their assumption that the same frequency can be reused in every cell sector, another claim which no experimental report verifies in the 2 GHz proceedings). Thus, instead of actually loading real cells with real handsets there are brief references to the simulation of "other user noise" without any description, calculation, or measurement of this all critical input.

3. Reasonable Outgrowth

Once again, Qualcomm ignores the record and shows its technical analysis skills to be defective.

By way of background, Omnipoint's pioneers preference request and all of its subsequent related filings and experimental reports describe the Omnipoint 2 GHz PCS system as employing "10 MHz and sub 10 MHz" rf channels, not just 10 MHz channels as Qualcomm implies.

Omnipoint's Pioneer's Preference Request at 7, 17, 26 (May 4, 1992); Omnipoint Replies at 25 (plus Attachment) (June 25, 1992); Omnipoint Experimental Report at Section 4.2.1 (April, 1992). There are many references to Omnipoint's tests of 5 MHz to 10 Mhz bandwidths.

Omnipoint April 1992 Experimental Report, Section 4.2.1.; Omnipoint August 1993 Experimental Report at 7. Omnipoint's experimental reports documented the tradeoffs among all bandwidths with respect to OFS sharing. Omnipoint Reply Comments, GEN Docket No. 90-314, Attachment (June 25, 1993). Further, Omnipoint stated in its pioneer's preference application as well as its subsequent filings that the system could use either TDD or FDD. Omnipoint Pioneer's Preference Request at 8, 18, 26 (May 4, 1992). The addition of TDD to a direct sequence spread spectrum system was something which many other companies did not think was even possible.⁷

Qualcomm first makes the false assumption that, because the allocation has "upper and lower blocks" (presumably referring to the pairing of PCS bands in the allocation, jointly labeled A, B, C), this is somehow inconsistent with Omnipoint's TDD method. Petition at 19. In reality, a system capable of TDD can operate in any allocation, whether paired or unpaired, and thus has more flexibility than an FDD-only system. A system capable of TDD obtains benefits from the paired frequency separation, an FDD-only system requires it.

⁷ See, e.g., Southwestern Bell's request for an experimental license. The circumstances under which TDD has benefits over FDD have been exhaustively discussed in prior documents.

Next, Qualcomm falsely claims that Omnipoint's system is unsuited for the 20 MHz and 30 Mhz allocations. Omnipoint was the first company to request 30 MHz allocations from the FCC, and the only company to request this during the pioneers preference application process. Omnipoint Reply at 16 (June 25, 1992). Omnipoint requested this primarily in order to provide sufficient spectrum to offer not just compressed voice services but also high speed data, digitized compressed video, and wireline quality voice services. Indeed, Omnipoint's system was optimized for 30 MHz regardless if bifurcated, but it will function in less.

Qualcomm should be grateful that Omnipoint pioneered the request for 30 MHz and a definition of PCS services that went beyond compressed voice. Many other companies have now followed Omnipoint's lead in recognizing the limits of a PCS allocation with only 20 MHz licenses, especially in the 1850-1990 MHz band. As everyone in the industry knows, Qualcomm has now followed Omnipoint's lead and is "evolving" its PCS system toward 5 MHz and 10 MHz channels. See testimony of Erwin Jacobs, Qualcomm, at FCC PCS Panel Discussion (April 12, 1994). Qualcomm is also following Omnipoint's lead in now promising to "evolve" its system to offer higher speed data (away from their pioneers preference limit of 9.6kbps). And Qualcomm has even recanted its attacks on those not focused on highly compressed voice, and is even admitting that some users might want better quality voice than when it originally insisted that their 8kbps compressed CELP vocoder was sufficient for everyone.

II. THE GRANT OF A PREFERENCE TO OMNIPOINT WAS NOT PROCEDURALLY DEFECTIVE

Qualcomm makes a series of unavailing claims that the Commission erred in its explanation of the grant of a preference to Omnipoint. Qualcomm's criticism of procedures in the Third Report and Order centers around four arguments: (1) the Commission failed to engage in an "independent" analysis of the record; (2) the Commission made typographical errors in the Third Report and Order; (3) the Commission incorrectly attributed video capability to the

Omnipoint preference; and (4) the Commission impermissibly relied on Omnipoint's August, 1993 Semi-Annual Experimental License Report.

Qualcomm's claim that an independent analysis of the record is required is vague. If Qualcomm means that the Commission must employ outside third parties to review the preference applications, this claim is unsubstantiated under the rules. The Commission specifically declined to require third-party review of the record evidence in preference proceedings.⁸ If Qualcomm means that there was no independent analysis because the Third Report and Order does not reflect "any balancing or weighing of the arguments, but merely repeats Omnipoint's claims,"⁹ a review of the Third Report and Order, ¶¶ 51 - 74, reveals that this assertion is facially untrue. The Commission explained the position of each of the parties that objected to Omnipoint's tentative preference, it explained Omnipoint's reply to those objections, and it separately explained the Commission's reasons why the objections did not prevail in the Commission's final decision.¹⁰

Independent confirmation of Omnipoint's technology was also repeatedly made by industry leaders involved in this proceeding. Omnipoint permitted dozens of other companies to test its equipment, many of which filed experimental reports. As detailed above, independent testing results are reflected in the reports filed by those companies. Omnipoint also conducted its own tests using its experimental licenses, and filed reports detailing the results in accordance with the license terms. All of these reports substantiate Omnipoint's preference request.

⁸ Report and Order, 6 FCC Rcd. 3488, 3494 (1991).

⁹ Petition at 19-20.

¹⁰ The Commission's manner was very clear and methodical: ¶ 58 identifies the objections of GTE and PageMart, Inc, ¶ 59 summarizes Omnipoint's response to those claims, and ¶ 60 articulates the Commission's decision not to accept those objections; ¶ 61 to 63 consider and reject a second GTE objection in the same manner; ¶ 64 to 67 consider the Bell Atlantic objections in the same manner; ¶ 68 and 69 review the Pacific Bell objection in the same manner; and, finally, in ¶ 70 to 73, the Commission summarizes Qualcomm's objections, it describes Omnipoint's response, and it states its reasons for rejecting Qualcomm's objections.

Qualcomm's complaints about typographical errors are also unavailing. Qualcomm does not substantiate its assertion that the Third Report and Order is "riddled with errors;" it identifies only two. The first is an obvious clerical error: three footnotes, which should have cited to the Omnipoint reply comments of March 1, 1993, used the short cite "Id." which technically did not refer to those comments.¹¹ Qualcomm concedes that the miscite did not cause any confusion, it understood that the Commission was, in fact, relying on the Omnipoint reply comments.¹² Further, the Commission's pinpoint cites to the Omnipoint reply comments, once one understands the "Id." references, are correct. Therefore, this is nothing but a harmless error. Omnipoint would applaud Qualcomm for its assiduous attention to detail were it not for the fact that the Petition, as well as most of Qualcomm's early submissions also contain such typographical errors.¹³

Qualcomm identifies a second typographical error in the statement: "its system is distinguished by its use of TDD to separate users in time."¹⁴ Obviously, "TDD" should have read "TDMA." Although the Commission made a misspelling by two letters, Qualcomm explodes this typographical error into an argument that the Commission's staff does not understand the technical difference between TDD and TDMA. There is no basis for, and Omnipoint strongly objects to, the implication that the Commission's staff is ignorant of the difference. See, Third Report and Order at ¶ 67. Moreover, Qualcomm obviously understood what the Commission meant.

¹¹ Qualcomm tries to make the most of this clerical error at n.67 of its Petition.

¹² Qualcomm states: "the footnotes used to support the Commission's summary of Omnipoint's reply comments actually cite to the pleadings of the other parties." Petition at 20.

¹³ See, e.g., Petition (at first page of Summary Qualcomm spells "weight" as "wight") and at 23 (Qualcomm's use of the phrase "was at[sic] that it has," if it had found that in the Third Report and Order, would undoubtedly have been part of the Qualcomm scenario of the "riddles" of Commission errors).

¹⁴ Petition at 20, *quoting*, Third Report and Order at ¶58.

Qualcomm continues with its hypertechnical dissection of the Third Report and Order by attacking the Commission's statement that Omnipoint's request in PP-58 is based on equipment capable of providing video services in addition to voice and data. Omnipoint has repeatedly shown that its 2 GHz PCS equipment is quite capable of communicating digitized compressed video signals, which any system capable of 64 kbps can do. While Qualcomm may choose to ignore this, the Commission did not. See Third Report and Order at n.72.

Finally, Qualcomm raises once again its argument that Omnipoint's August 1993 Semi-Annual Experimental License Report was impermissible. The Commission has already denied the substance of Qualcomm's arguments.¹⁵ Qualcomm revised these arguments just two months ago and Omnipoint has fully responded.¹⁶ Despite three attempts, Qualcomm has never prevailed in this argument. The Commission has no reason to find the Omnipoint report "impermissible" and so reliance on it is completely appropriate. Even without the report, the evidence in the record is more than ample to support a preference to Omnipoint.

III. GRANTING OF A PREFERENCE TO OMNIPOINT IS CONSISTENT WITH THE POLICIES BEHIND THE PIONEER'S PREFERENCE RULES

Clearly the grant of a pioneers preference to Omnipoint represents a paradigm example of how the pioneers preference program was supposed to work. Qualcomm's claim that Omnipoint didn't disclose enough about its proposal is absurd considering how much detail was provided in Omnipoint's experimental reports relative to the requirement to report "preliminary results". See Memorandum Opinion and Order, 7 FCC Rcd. 1808, 1809 (1992). More importantly, consider the fact that Omnipoint is the only company in any pioneer's preference docket to turn its technology over to other companies to test during the period before the tentative decisions and during the comment periods, including to those with pioneers preference applications competing for the same territory.

¹⁵ Order, GEN Docket No. 90-314, DA 93-1055 (OET August 30, 1993).

¹⁶ Letter to Andrew S. Fishel from Omnipoint, GEN Docket No. 90-314 (filed February 23, 1993).

Qualcomm claims that Omnipoint's statement that the system uses a "proprietary coding scheme" makes it impossible to evaluate Omnipoint's preference. Qualcomm never disclosed its choice of codes. Further, Qualcomm's general accusation is hypocritical considering Qualcomm disclosed virtually nothing essential to its system, as shown above, and never filed anything at all with respect to the focus of its original pioneers preference claims on OFS sharing before the tentative decision was made on October 8, 1992.

QUALCOMM contends that Omnipoint's voluminous pleadings and reports do not reveal all of the critical details of its PCS system. Only QUALCOMM makes this claim, and does so now for the first time in these proceedings. The new claim ignores the fact that Omnipoint has furnished the Commission with everything that it has been required to disclose.

IV. THE COMMISSION APPLIED CONSISTENT STANDARDS TO THE QUALCOMM AND OMNIPOINT PROPOSALS

The records evidence in this proceeding, along with the Commission's precedents in the narrowband pioneer's preference proceeding, which denied preferences based on services already developed, rebuts Qualcomm's contribution that the Commission applied inconsistent standards to the Qualcomm and Omnipoint proposals. See Qualcomm Petition at 23-24; Memorandum Opinion and Order, GEN Docket No. 90-314, FCC 94-30 at ¶ 55 (March 4, 1994).

The record is unambiguous that Qualcomm literally photocopied its 800 MHz standards committee documents and proposed that that system be used in an identical manner at 1850-1990 MHz. Tentative Decision, 7 FCC Rcd. 7794 (1992) at ¶ 32.

On the other hand, Omnipoint did not simply upband its 900 MHz cordless phone. Rather, Omnipoint described an entirely new system for operation at 1850-1990 MHz. Id. at ¶¶ 19-20. See also Omnipoint Opposition to Motion For Leave, GEN. Docket No. 90-314, Aug. 11, 1993 at 16-17. Nor did Omnipoint propose to simply upband its 900 MHz product, as Qualcomm did.

Thus, it is unambiguous that the Commission did not give unequal treatment to the two parties. Omnipoint filed its experimental reports with respect to its proposal, Qualcomm did not. Omnipoint proposed a PCS system and service specific to 1850-1990 MHz, Qualcomm did not.

V. **QUALCOMM'S PROPOSAL CLEARLY FAILS TO MEET THE REQUIREMENTS FOR A PREFERENCE.**

Qualcomm's failure to qualify for a pioneer's preference, let alone to obtain one, underlies its attack of the preference granted to Omnipoint. But, as Omnipoint demonstrated in its earlier filings, the Commission had little choice but to conclude that Qualcomm was not entitled to a pioneer's preference for its work. The recirculated as well as new arguments in Qualcomm's petition fail to demonstrate any error by the Commission.

Qualcomm now contends, for example, that it seeks a preference for its "breakthroughs" in digital baseband engineering, not for its work in radio frequency engineering, and that it did not develop CDMA for implementation of its 800 MHz digital cellular system. This is not what Qualcomm indicated in its May 4, 1992 application for a preference.

As noted in Omnipoint's March 1, 1993 reply, Qualcomm's May 4, 1992 pioneer's preference application consists of a 10-page introduction attached to a 60 page document which states right on the cover "This document has been prepared to assist the TIA TR45 Committee," a committee that sets standards for the U.S. cellular industry. Qualcomm simply filed a standards committee submission discussing 800 MHz cellular operation into the docket and did not report on any analysis at 1850-1990 MHz, but nevertheless expected to be rewarded with a pioneer's preference at 1850-1990 MHz. Qualcomm then waited until a month after the tentative pioneer's preferences were awarded before submitting its first experimental report.

Furthermore, cursory review of the ten-page introduction to Qualcomm's preference proposal reveals its focus on radio frequency engineering as it goes to great lengths to describe how important sharing with the incumbent microwave users is and how the company will develop and test techniques for doing so. Then, after discussing its 800 MHz tests it recites the